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THE GRAINS OF ARGENTINA  
(Particularly Wheat and Corn)

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In order to be fully informed on the subject of Argentine grain production one must first have a general knowledge of the country, its topography, climate and soil conditions, and its agricultural development.

Argentina is slightly less than half the size of the United States proper. About two-thirds of it is not fit for cultivation on account of being mountainous or too dry. The cereal belt, about 200,000,000 acres in area, occupies the northeast portion of the country on the Atlantic seaboard. Practically every portion of it lies within 400 miles of ocean traffic routes; the average haul from farm to seaports being 155 miles.

The topography of this region is very flat, broken only by sluggish streams. These plains are treeless except for groves that have been planted by man. The soil of the grain belt is a deep black loam becoming more sandy and lighter toward the west and northwest.

The climate of the cereal belt is mild and is not subject to the extremes in temperature that occur in the United States. In winter frosts occur, but are seldom severe enough to freeze the ground or to kill the grass. In summer, 100° F. is the upper limit of temperature, and that too only in exceptional years. Hot nights are of very rare occurrence. Winter killing of wheat is practically nil but late frosts in the spring of the year when the grain is in blossom or in the dough state of maturity sometimes damages the crop. One of the worst years on record for frost damage was in 1937 when the crop was reduced about 50,000,000 bushels, or 20 percent, from this cause besides seriously damaging the grade and quality of several millions of bushels of the harvested grain.

The rainfall in the grain belt is about 40 inches per year in the extreme northeast tip and tapers off at a fairly uniform rate toward the southwest to about 18 inches.

The population of the country is about 13,000,000 with one-fourth of it in or around Buenos Aires, the largest city in the Southern Hemisphere.

The ownership of the land is in the hands of a comparatively few people, consequently the farms are rather large, being usually above 400 acres in size, and sometimes as large as 125,000 acres. All of the land, even in the grazing sections, is fenced in. The fencing is of uniform style and very substantial.

Pasturage in the grain belt is excellent and available throughout the year. Also, alfalfa hay is cheap and abundant, consequently cattlemen do not feed their cattle grain. Approximately fourteen million acres of the land in the grain belt are in alfalfa, some fields of which can be cropped as many as 16 successive years. This makes the country ideal for cattle raising. This branch of agriculture is most to the liking of the aristocratic Argentinian

landowner and, whenever he can do so profitably, he is quite content to follow it almost to the exclusion of other forms of agriculture.

Livestock raising and grain production, although carried on in the same areas, are not usually combined by individual farmers. Any rotation of crops practiced is of very long duration. Whenever a landowner decides to turn his land over to grain production he usually divides a portion of his estate into relatively small plots of a few hundred acres and leases these to tenant farmers for four year periods on a share-crop basis. The landlord furnishes the equipment and the seed and usually takes 50 percent of the crop. These tenant farmers are mostly of Spanish and Italian origin and many of them live in sun-baked mud huts and on a low standard.

The methods of farming and equipment used in the production of grain are very modern. It is reported that more than 40,000 combines have been sold in Argentina.

The bag system of handling grain is used on all farms except one or two, and until quite recently all transportation and storage of grain was in bags. At the present time the government is engaged in the construction of a number of grain elevators at terminal and subterminal points for the storage and handling of bulk grain. On the farm, the sack system of handling grain is likely to continue for a long time because in most instances it is the most economical and best suited to the peculiar conditions of the country.

Argentina is essentially an agricultural and pastoral country as is evidenced by the fact that agricultural and pastoral products account on the average, for nearly 95 percent of all its exports.

Although Argentina is rich in agricultural resources, it is poor in the mineral resources which are essential to manufacturing industry. It has no coal, iron or copper, and, in the eastern part, even has no gravel or sand suitable for making concrete, but must import these essential road making and construction materials.

#### General Agriculture

Wheat production, on the basis of the 1927-37 10-year period, averages 238,000,000 bushels annually, 61 percent of which is exported.

Corn production averages 325,000,000 bushels, or about three-fourths that of Iowa. Eighty-one percent of the Argentina production is exported. These corn exports represent nearly three-fourths of the world export trade in this grain.

Flaxseed production averages 72,000,000 bushels, or about two-thirds of world production. Ninety percent of the Argentina production is exported. These exports, one-fifth of which go to the United States, represent about 80 percent of the world trade in flaxseed.

Rye production averages 8,000,000 bushels, 70 percent of which is exported. This rye is of the small kernalled, low starch content type.



Barley production averages 22,000,000 bushels, approximately 63 percent of which is exported.

Oats is largely produced as a pasture crop for the winter months and the production of the grain is chiefly incidental thereto. The amount of grain produced averages only 62,000,000 bushels, 51 percent of which is exported. These oats are chiefly of the red type, having a large kernel, and yield a high proportion, by weight, of groats.

Rice production in recent years has been increasing very rapidly but is still considerably below domestic requirements. In 1931 rough rice production amounted to 2,300,000 bushels. Domestic consumption of this grain amounts to about 3,500,000 bushels.

In addition to the afore-mentioned grains, Argentina produces large quantities of sunflower and canary seed (Alpista), most of which is exported.

Recent cotton production amounts to 2 to 3 hundred thousand bales, about half of which is exported.

With respect to livestock, Argentina has a population of approximately 33,000,000 cattle, over half of which are Shorthorns, 4,000,000 pigs, and 44,000,000 sheep and lambs.

There is also a well-developed fruit industry, especially of apples, pears, and grapes.

### Wheat

The wheat produced is all of red color except about one-half of one percent which is of the so-called "Candeal" type. This latter is of the polonicum (Polish) and durum species, but chiefly of the former. Although generally plump, clean, free from mixtures of other wheats, and of vitreous appearance, Candeal wheat is usually considered inferior in quality for alimentary pastes to United States and Canadian durum wheats. Nearly the entire production of this wheat is exported. It is produced only in the south and southwestern parts of the grain belt. The red wheats of common species, constituting 99.5 percent of the total wheat production of the country, include both winter and spring varieties. The number of varieties in commercial production is quite large and each is grown over a large portion of the cereal belt. The government, in its efforts to improve marketing conditions and produce better wheats, is attempting to eliminate the inferior varieties and to reduce the number of varieties grown. Approximately 45 percent of the wheat produced is of winter habit, and 45 percent of spring habit, with the remaining 10 percent of intermediate season habit of seeding.

As in the case of the Pacific Northwest region of our country spring and winter varieties can be produced effectively side by side throughout the entire grain belt. Winter varieties, however, predominate in the southern and southwestern or colder parts of the grain belt and spring varieties in the northern and northeastern or warmer parts. This is the reverse of seeding practice in the United States.

Seeding time for the winter wheats is April and the first half of May in the southern part of the country, and May and June in the northern part. For the spring wheats, seeding time is July and August in the southern part and August in the northern part.

The principal varieties produced and the percentage of the total production constituted by each are as follows:

Principal Argentine Wheat Varieties			
Varieties	Seeding habit	Kernel texture	Percent of total Production
Common wheats			
38 M A	spring	semihard	28.9
Lin Calel	winter	hard	9.7
Blackhull	winter	hard	6.5
Klein 32	spring	semihard	6.1
Klein 40	- - -	soft	4.7
Acero	- - -	soft	4.0
Klein 33	spring	semihard	3.4
La Prevision 25	intermediate	semihard	2.8
Kanred	winter	hard	2.7
Other varieties of lesser importance	various	various	34.8
Durum and Polish wheats			
Candeal	- - -	hard	.4
TOTAL			100.0

From the preceding figures it will be noticed that the variety 38 M.A. is outstandingly greatest in importance from the standpoint of the amount produced, and that Lin Calel is second.

From the standpoint of kernel texture approximately 16 percent of the wheat crop is hard, 70 percent semihard, and 14 percent soft. On the basis of the United States wheat standards, 65 percent of it would classify as Soft Red Winter and 35 percent as Hard Red Winter. Of the latter, about two-fifths is of premium quality and three-fifths of ordinary quality. In Argentina no distinction is made between the spring and winter wheats, and since there are no pronounced and consistent differences of their kernel characteristics, as in the case of United States spring and winter wheats, the classification here given makes no attempt to distinguish between them but merely follows their predominating physical characteristics.

The quality of the wheat to a large extent is closely related to variety and the area of production. The varieties Marquis, Sudoeste, Guatrache, Sinmarq, Piramide, and Lin Calel are outstandingly best in quality with Kanred, Kanhard, Utracan, Blackhull, La Prevision 32 only of intermediate

quality. The areas which produce the wheats of best quality are the low rainfall areas, namely the southern and southwestern portion of the grain belt.

The crop average protein content of Argentine wheat is generally about 12.5 percent, which is not much different from that of the United States Hard Winter wheat of our Middle West. The wheats produced in the southern and western portions of the grain belt are generally very appreciably higher in this factor than are those produced in the northeastern portion. In this respect protein content shows the same relation to quality as rainfall does. On the other hand the relationship of protein content to variety and hardness of kernel is opposite to its relationship to quality.

This is evidenced by the fact that many of the weak varieties show a higher protein content than do the strong varieties and by the further fact that the protein content of the official soft wheat types for the two seasons 1936-37 and 1937-38 (the time of my stay in Argentina) averaged higher than that for either the hard or semiduro types.

In test weight the Argentine wheats usually average fairly high and never reach the lower extremes met with in the United States for the reason that rust infection and hot winds are not so prevalent there as in the United States.

The damaged-kernel content of Argentine wheats is generally low, except for the presence of weevil damaged kernels. In fact, weevil infestation is quite general and frequently very serious throughout the northern half of the grain zone. In this section weevils are an ever present menace to the wheat and corn crops. They make their first attack on the crop while the grain is still in the fields.

Stinking smut is of frequent occurrence in the wheats of the southern portion of the grain belt but seldom in sufficient amount to require special treatment of them in cleaning for milling purposes. In the northern part of the grain belt smut is of infrequent occurrence.

The foreign matter content of Argentine wheat is usually so low as to be of little or no importance in marketing. Wild oats and mustard seed are probably of most frequent occurrence. Wild oats occurs chiefly in the wheats from the southern part of the grain belt. Corn cockle and rye are occasionally present but only in very insignificant amounts. Garlic is not present.

The odor of sweet clover occurs in some of the wheats, but only in those from the Province of Entre Rios located in the northeastern portion of the grain belt.

In the exporting of wheat from Argentina no tendency has been shown by exporters to ship abroad the wheats of inferior quality and keep those of superior quality at home. This is probably due on the one hand to a lack of appreciation for quality at home sufficient to induce buyers to pay premiums for such wheat and on the other hand to the low proportion (approximately 32 percent) of the crop needed for domestic milling purposes.



The grinding capacity of the wheat-milling industry is larger than is necessary for the country's needs. According to recent official government figures there are 186 mills operating, nearly all of which are located at interior points. The total grinding capacity of these mills is in the neighborhood of 76,000 barrels of flour per day of 24 hours. The port mills are generally not so prosperous as the interior mills owing to the small export trade and their inability to compete with the interior mills for the domestic trade except at the point of their location. Flour exports in recent years have averaged about 900,000 barrels per year, 350,000 barrels of which go to Brazil.

Owing to the fact that grain or mill feeds are not fed to cattle throughout the country and that the dairy and hog industry is very little developed, mill offals are a drug on the market and sell for much less in relation to flour prices than they do in the United States.

### Corn

Corn production is concentrated in the east central portion of the grain belt. This grain cannot be grown very successfully in the southern or southwestern parts because of deficient moisture and cool nights, or in the northern part because of despoilation by langostas, which are large migratory grasshoppers.

The growing season for corn is long and seeding time extends over a period of two months or more in the springtime. Harvesting is delayed until late fall, long after the grain has fully matured and dried. The fodder is not cut, but pickers go through the field and strip the ears from the stalk. These ears are then placed in "troches", crudely constructed wire and fodder enclosures, until time for marketing. These troches are not very weatherproof. In fact when the corn stored in them is shelled it frequently is so wet as to require artificial drying in order to put it into condition for marketing. The drying is sometimes by mechanical means, the same as is used in the United States, but frequently is accomplished by exposing the damp grain to the direct rays of the sun during dry weather. The exposing is done by spreading the grain, to a shallow depth, on a burlap or canvas laid on the dry ground and turning it at short intervals of time by hand scooping. The cheapness of labor makes this latter method of drying practical in Argentina.

The corn produced is almost wholly of the flint type. Not more than one-half of one percent is of the dent type. The reasons for the production of flint corn in preference to dent corn include the following: Flint corn has greater hardness of kernel, making it more resistant to weevil infestation, weathering, and spoilage while in storage or in transit to overseas points; and it commands a relatively higher price on European markets. Another reason is that the feeding of grain to livestock is not practiced in Argentina; consequently there is little appreciation or recognition of the superior feeding properties of dent corn.

The flint corn is of four general classifications, namely "Amarillo" (yellow color), "Colorado" (reddish orange color), "Morochó" (white color), and "Cuarentón". The last is a smallkerneled flint type of corn of reddish



orange color and commands a premium over other sorts on European markets. Its smallness of kernel makes it suitable for feeding to poultry without the necessity of cracking it. One of the varieties, "Amargo", which is of considerable importance in some sections, contains a bitter principle in the stalk which makes it somewhat resistant to attack from langostas.

Based on reliable grading analysis data covering the last 4 crops, the corn exported from Argentina, constituting approximately 81 percent of the total production, is of the following classes and approximate proportions:

Amarillo (flint corn of yellow color) - - - - -	2.0 percent
Colorado (flint corn of reddish orange color) - - -	44.5 "
Mixed Amarillo and Colorado - - - - -	50.0 "
Cuarenton (smallkerneled flint corn of reddish orange color) - - - - -	1.5 "
Morocho (flint corn of white color) - - - - -	2.0 "
	<u>100.0</u> "

Occasionally, shipments of corn of the dent type and popcorn have been made, but these have never amounted to more than a tenth of one percent of the total for any of the 4 years studied.

Weevil infestation and moisture content are the two factors which chiefly affect the market value and grade of Argentine corn. Weevils are present in practically all shipments of corn. The seriousness of their infestation increases as the market season progresses. Some months shipments average as much as 18 percent of weevil-bored kernels. The general prevalence of weevil infestation is evidenced by the fact that the government finds it necessary to make mandatory the acceptance of corn delivered in the domestic market or for export containing up to a certain specified percentage of weevil-bored kernels, which percentage is increased as the marketing season advances and in some years may be as high as 20 percent.

In the case of moisture content the government places a maximum limitation on the percentage of moisture that export corn may contain. This is varied according to season but not to any great extent. Fifteen to 15.5 percent is about the range in the limitation placed on this factor. The reason for limiting the moisture content of export corn is to prevent or reduce the spoilage hazard during ocean transportation.

Other factors which sometimes affect the quality of Argentine export corn are "verdin" or blue mold, broken kernels, and sprouted kernels. All of these, however, are only of very minor importance.

#### Grading System

For a great many years the basis for the marketing of grain in the Argentine has been the F.A.Q., or fair average quality, standard. In the case of domestic transactions this standard is the average of the crop but in the case of export transactions it is the average of the month's shipments. These averages cover each of the ordinary so-called grading factors, such as test weight, foreign material, damaged kernels, etc. Whenever the quality of the

grain delivered falls below the F.A.Q. standard, whether in one or all of the factors, the buyer is permitted an allowance or discount from the basic price in accordance with established rules. This system provides no premium for quality superior to the F.A.Q. standard, except in the case of test weight.

Besides providing no reward to the producer of superior quality grain, the F.A.Q. system of standards provides no practicable basis for the storage operations of bulk grain where identity cannot be preserved or in the issuing of negotiable warehouse receipts thereon. In other words, the F.A.Q. basis is not adapted to the modern practices of handling and merchandising grain. To eliminate these faults the Argentine government for a number of years has been trying to evolve a system of fixed standards similar to that used in the United States and Canada. Thus far it has only established a classification framework of such a system while still retaining the old F.A.Q. basis for the grade requirements.

Under these standards the wheats of the country are divided first into areas or zone of production and then classified by variety characteristics of quality. These zones are Rosafé, Buenos Aires, and Bahía Blanca, and to some extent are expected to represent differences in quality due to climate. Their boundaries extend from east to west across the grain belt. If, instead, they extended from southeast to northwest they would more nearly tend to mark the differences in quality due to climate. The classification according to variety separates the wheats into three classes, namely duro, semiduro, and blando (hard, semihard, and soft). The duro class includes the varieties of superior industrial quality, the semiduro class, the varieties of intermediate quality, and the blando class, the varieties of weak quality.

Two graduations of quality have been established for these classes which in reality are to F.A.Q. standards, one of higher quality than the other. This graduated F.A.Q. system has not been very well received by the grain trade because it does not correct the faults of the older F.A.Q. system and, furthermore because it is more complicated to operate than the older system.

The next step in this evolutionary process, namely that of establishing definite fixed, instead of variable, standards of quality, probably will be taken in the next year or so when the Government begins operation of its new grain elevators. Model standards of the fixed type have been prepared and promulgated as permissive standards for experimental purposes. In the light of the experience thus gained these permissive standards no doubt will be revised before being made mandatory at some later date.



